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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/585,456

07/07/2006

Tadashi Yano

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EXAMINER

COUGHLIN, ANDREW J

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/585,456	Applicant(s) YANO ET AL.	
	Examiner ANDREW J. COUGHLIN	Art Unit 2889	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20060707, 20070910, 20071119</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The references cited within the IDS document submitted on 07/07/2006, 09/10/2007 and 11/19/2007 have been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Galli (US Pub. No. 2004/0032728 A1).

As to claim 1, Galli teaches an LED chip (#14 in Fig. 8 and in ¶ [0023]); a reflector with a reflective surface that reflects the emission of the LED chip at least partially (#24 in Fig. 8 and in ¶ [0023]); and a substantially hemispherical light-

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transmissive member that covers the LED chip (#16 in Fig. 8 and in ¶ [0021]), wherein the surface of the substantially hemispherical light-transmissive member includes an upper surface portion (Portion of #16 where light can escape, coinciding to aperture #104 in Fig. 8 and in ¶ [0027]) located over the LED chip and a side surface portion located below the upper surface portion (Areas on surface #102 of #16 in Fig. 8 which are covered by layer #100 in Fig. 8), at least a part of the side surface portion having a lower transmittance than the upper surface portion (reflective surface #24 in Fig. 8 and in ¶ [0027] prevents transmittance).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. (US 6,155,699) in view of Sharp Corp (JP 5-27688 A) which will be referenced as "Sharp" throughout the office action.

As to claim 1, Miller et al. teaches an LED lamp comprising: an LED chip (#12 in Fig. 2 and in col. 5 ln. 14-15); a reflector with a reflective surface that reflects the emission of the LED Chip at least partially (#14 in Fig. 2 and in col. 5 ln. 15-16); and a substantially hemispherical light-transmissive member (#22 in Fig. 2 and in col. 6 ln. 6) that covers the LED chip. Miller et al. is silent about a part of a side surface of the

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substantially hemispherical light-transmissive member having a lower transmittance than an upper portion of the substantially hemispherical light-transmissive member.

However, Sharp teaches a covering member for an LED chip which has an upper surface portion located over the LED chip and a side surface portion located below the upper surface portion, with at least a part of the side surface portion having a lower transmittance than the upper surface portion. Sharp teaches a light impermeability part (#7 in Fig. 2) that is applied on the side surface portion of a sealing resin (¶ [0015]) in order to prevent light leakage between multiple LED units.

It would have been obvious to one of ordinary skill in the art at the time the invention occurred to supply light impermeability part taught by Sharp onto the substantially hemispherical light-transmissive member taught by Miller et al. in order to prevent light leakage between multiple LED units.

As to claim 2, Miller et al. and Sharp combine to teach the entirety of claim 1. Additionally, Miller et al. teaches an LED lamp wherein the light-transmissive member also covers at least the reflective surface of the reflector (#22 covering the surface of #14 in Fig. 2).

As to claim 4, Miller et al. and Sharp combine to teach the entirety of claim 1. Additionally, Sharp teaches an LED lamp wherein at least the part of the side surface portion of the light-transmissive member has been processed so as to have the lower transmittance than the upper surface portion by subjecting the light-transmissive member to a surface treatment (¶ [0015]). Examiner notes that "surface treatment" is

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broad and applying a light impermeability part to the periphery of a sealing resin is being interpreted as being a "surface treatment".

As to claim 5, Miller et al. and Sharp combine to teach the entirety of claim 1. Additionally, Sharp teaches an LED lamp wherein at least the part of the side surface portion of the light-transmissive member has a transmittance of substantially zero (¶ [0015]). The side surface is described as being impermeable to light in paragraph [0015] and throughout the detailed description of the Sharp document.

As to claim 6, Miller et al. and Sharp combine to teach the entirety of claim 1. Additionally, Sharp teaches an LED lamp wherein at least the part of the side surface portion of the light-transmissive member is arranged so as to define an angle of approximately 45 degrees with respect to an optical axis that extends through the LED chip (¶ [0017]). Examiner notes that there are many optical axes that extend through the LED unit, making many different angles (including 45 degrees) available for a given side surface portion. Additionally, Sharp teaches that the height of the light impermeable part can be varied depending on the dot pitch (pixel pitch, distance between LED chips) of the lamp. It would have been obvious to one of ordinary skill in the art to define an angle of approximately 45 degrees with respect to an optical axis that extends through the LED in order to produce a display with a specific dot pitch while maintaining luminance and avoiding light leakage.

As to claim 7, Miller et al. and Sharp combine to teach the entirety of claim 1. Additionally, Sharp teaches an LED lamp wherein the upper surface portion of the light-transmissive member is arranged so as to define an angle of at most 15 degrees with

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respect to an optical axis that extends through the LED chip. Examiner notes that there are many optical axes that extend through the LED unit, making many different angles (including 15 degrees) available for a given upper surface portion. Additionally, Sharp teaches that the height of the light impermeable part can be varied depending on the dot pitch (pixel pitch, distance between LED chips) of the lamp. It would have been obvious to one of ordinary skill in the art to define an angle of approximately 15 degrees with respect to an optical axis that extends through the LED in order to produce a display with a specific dot pitch while maintaining luminance and avoiding light leakage.

As to claim 9, Miller et al. and Sharp combine to teach the entirety of claim 1. Additionally, Sharp teaches an LED lamp wherein all of the side surface portion of the light-transmissive member has lower transmittance than the upper surface portion (#7 in Fig. 2, and in ¶ [0015]).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. (US 6,155,699) and Sharp Corp (JP 5-27688 A) as applied to claim 1 above, and further in view of Vriens et al. (US 5,813,753).

As to claim 8, Miller et al. and Sharp combine to teach the entirety of claim 1. Miller et al. and Sharp fail to teach the upper surface portion of the light-transmissive member being substantially planar.

However, Vriens et al. teaches a substantially planar glass plate which covers an LED unit (#36 in Fig. 3 and in col. 5 ln. 3). It would have been obvious to one of ordinary

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skill in the art to apply a planar glass plate as taught by Vriens et al. into the LED lamp taught by Miller et al. and Sharp in order to streamline manufacturing.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. (US 6,155,699) and Sharp Corp (JP 5-27688 A) as applied to claim 1 above, and further in view of Yamuro (US 5,931,570).

As to claim 10, Miller et al. and Sharp combine to teach the entirety of claim 1. Miller et al. and Sharp fail to teach an LED lamp wherein the upper surface of the light transmissive member and/or the reflective surface has a diffusing surface.

However, Yamuro teaches an upper surface of a light transmissive member having a diffusing surface (#15, #18, #19 and #21 in Figs. 6A-D and in col. 4 ln. 9-52). Yamuro includes several types of diffusing surfaces for LED lamps that can be used to ensure the light from the LED chip is viewable from multiple viewing angles.

It would have been obvious to one of ordinary skill in the art to supply the diffusing surfaces taught by Yamuro in the LED lamp taught by Miller et al. and Sharp in order to allow the light from the LED chip to be viewed from multiple viewing angles.

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taskar et al. (US 6,734,465 B1) in view of Sharp Corp (JP 5-27688 A).

As to claim 12, Taskar et al. teaches a substrate (#16 in Fig. 6 and in col. 6 ln. 19); an array of LED chips that are arranged two-dimensionally on the substrate (#11 in Fig. 6 and in col. 6 ln. 23-24); a reflector with a plurality of reflective surfaces (col. 6 ln.

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19-20), each of which reflects the emission of an associated one of the LED chips at least partially, and a plurality of substantially hemispherical light-transmissive members (#14 in Fig. 6 and in col. 6 ln. 6), each of which covers an associated one of the LED chips, wherein some of the substantially hemispherical light-transmissive members are located in the outermost part of the array of LED chips (Left and right sides of the array in Fig. 6). Taskar et al. is silent about the surface of at least each of those light-transmissive members includes an upper surface portion located over an associated one of the LED chips and a side surface portion located below the upper surface portion, at least a part of the side surface portion having a lower transmittance than the upper surface portion.

However, Sharp teaches a light impermeability part (#7 in Fig. 2) that is applied on the side surface portion of a sealing resin (§ [0015]) in order to prevent light leakage between multiple LED units. The light impermeable part provides for an upper surface portion located over an associated one of the LED chips and a side surface portion located below the upper surface portion, and at least a part of the side surface portion having a lower transmittance than the upper surface portion.

It would have been obvious to one of ordinary skill in the art at the time the invention occurred to supply light impermeability part taught by Sharp onto the substantially hemispherical light-transmissive member taught by Miller et al. in order to prevent light leakage between multiple LED units.

As to claim 13, Taskar et al. and Sharp combine to teach the entirety of claim 12. Additionally, Taskar et al. teaches and LED lamp wherein the light-transmissive

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members are combined together on the surface of the reflector (plurality of #14's on the reflective part of #16 in Fig. 6).

Claims 3, 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. (US 6,155,699) and Sharp Corp (JP 5-27688 A) as applied to claim 1 above, and further in view of Li (US Pub. No. 2005/0082973 A1).

As to claim 3, Miller et al. and Sharp combine to teach the entirety of claim 1. Additionally, Miller et al. teaches a wavelength converting portion which covers the LED chip (#36 in Fig. 2 and in col. 5 ln. 62), wherein the wavelength converting portion includes; a phosphor for converting the emission of the LED chip into light that has a longer wavelength than the emission (col. 7 ln. 1-5); and the wavelength converting portion being covered with the light-transmissive member (#22 covering #36 in Fig. 2). Miller et al. and Sharp fail to teach a resin in which the phosphor is dispersed.

However, Li teaches an LED lamp in which the phosphor layer is clearly defined as being a phosphor material dispersed in a resin (§ [0028]). Li teaches dispersing a phosphor in a resin material so that the color of the phosphor layer can be fully mixed with light from the chip to produce the designed color of light (§ [0028]).

It would have been obvious to one of ordinary skill in the art at the time the invention occurred to supply the phosphor material inside a resin material so that the color of the phosphor layer can be fully mixed with light from the chip to produce the designed color of light.

As to claim 11, Miller et al., Sharp and Li combine to teach the entirety of claim 3. Additionally, Miller et al. teaches an LED lamp wherein there is a gap between the side surface of the wavelength converting portion and the reflective surface of the reflector and wherein the gap is filled with the light-transmissive member (#22 between #36 and the slanted reflecting part of #14 in Fig. 2).

As to claim 14, Miller et al. and Sharp combine to teach the entirety of claim 1. Miller et al. and Sharp fail to teach an LED lamp wherein between the part of the side surface portion of the light-transmissive member, having the lower transmittance than the upper surface portion, and the bottom of the side surface portion, there is a portion having a higher transmittance than the part.

However, Li teaches an LED lamp wherein between the part of the side surface portion of the light-transmissive member, having the lower transmittance than the upper surface portion, and the bottom of the side surface portion, there is a portion having a higher transmittance than the part (#22 in Fig. 1 and in ¶ [0021]). Li teaches providing the phosphor layer away from the LED chip to prevent the phosphor degrading due to heat from the LED chip. Examiner notes that this layer of phosphor material is designed to absorb light emitted from the LED chip and emit a light of a different wavelength. The light from the LED chip passes through a resin layer (#22 in Fig. 1), is absorbed in the phosphor layer (#23 in Fig. 1 and in ¶ [0021]), and the emitted back into another resin layer (#21 in Fig. 1 and in ¶ [0021]). Examiner notes that the phosphor layer ideally have a lower transmittance so as to absorb light for conversion.

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It would have been obvious to one of ordinary skill in the art to supply the phosphor conversion layer taught by Li into the LED lamp taught by Miller et al. and Sharp in order to allow light conversion to occur without degradation of the phosphor layer due to heat from the LED chip.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDREW J. COUGHLIN whose telephone number is (571)270-7813. The examiner can normally be reached on Monday through Friday during normal business hours of 7:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, TOAN TON can be reached on (571)272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Karabi Guharay/
Primary Examiner, Art Unit 2889

/AJC/